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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,071	02/17/2004	David C. Lizon	ADEP.01USU1	9469
27479	7590	04/11/2006	EXAMINER	
COCHRAN FREUND & YOUNG LLC			FRANK, RODNEY T	
2026 CARIBOU DR			ART UNIT	
SUITE 200			PAPER NUMBER	
FORT COLLINS, CO 80525			2856	

DATE MAILED: 04/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/780,071	LIZON ET AL.	
	Examiner	Art Unit	
	Rodney T. Frank	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6-8,13 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 2-5,9-12 and 14-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6-11, 13-15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha (U.S. Patent Number 6,889,560), and further in view of Lichte (U.S. Patent Number 5,303,585).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing

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that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

3. Sinha discloses an apparatus for noninvasively monitoring the flow and/or the composition of a flowing liquid using ultrasound is described. The position of the resonance peaks for a fluid excited by a swept-frequency ultrasonic signal have been found to change frequency both in response to a change in composition and in response to a change in the flow velocity thereof. Additionally, the distance between successive resonance peaks does not change as a function of flow, but rather in response to a change in composition. Thus, a measurement of both parameters (resonance position and resonance spacing), once calibrated, permits the simultaneous determination of flow rate and composition using the apparatus and method of the present invention (Please see the abstract).

4. With regard to claims 1, 6, 17, 18, and 19, the basic limitations of the claims are disclosed in the Sinha reference in view of figure 1c and the disclosure, specifically, an apparatus for measuring liquid level in a container which comprises in combination (a) a transducer in physical contact with the outside of a wall of the container for generating at least two acoustic resonance responses in the liquid substantially perpendicular to the surface (transducer 24); (b) a sweep generator for electrically exciting said transducer over a chosen range of acoustical frequencies and having a chosen waveform (26), and (c) a receiver for measuring the acoustic frequencies for at least two resonant responses (transducer 24), wherein the various independent apparatus claims are mere variations of the independent claim 1, and thus since claim 1 characterizes the

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overall breath of the claims, only that claim is used to describe the claims of this rejection. In a similar fashion, all these claims contain a similar limitation that is not specifically disclosed in the Sinha reference with regard to the placement of the transmitting transducer, whereby said transducer is to be located below the surface of the liquid. The Sinha reference has the transducer located above the liquid surface, however one of ordinary skill in the art would be able to simply place the transducer on the bottom of the vessel to be measured because the basic principle for operation established in the art is that the transducer signals are transmitted and reflected off a surface of the liquid level to be measured. Therefore, one skill in the art could arrange the transmitting transducer either above or below the liquid surface without altering the operation of the device, and therefore the mere rearrangement of the transducer location would not be considered novel in view of the Sinha reference. Sinha does not state that a fluid through the pipe has to fill the entire pipe, so there could be a liquid/gas interface in the pipe of Sinha, but these limitations are not specifically disclosed. Therefore, the examiner has relied upon the teachings of Lichte to meet these specific claim limitations.

Lichte discloses a volume sensing system includes electronic circuitry, which is electrically connected to an ultrasonic transducer. The transducer is affixed by means of an adaptor to the base of a container having a known configuration. The container holds a liquid and a gas so that a liquid-gas boundary is formed within the container. The transducer generates ultrasonic pulses, which propagate through the liquid, are reflected at the liquid-gas boundary, and are received again by the transducer. The

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received return pulse is converted into an electrical signal which is analyzed by the electronic circuitry to determine the level of the liquid within the container. The level of the liquid within the container is then employed to determine the volume of the liquid within the container in accordance with the configuration of the container. In a preferred embodiment, the adaptor includes an indicator which may be used to identify the configuration of the container (Please see the abstract).

Both Lichte and Sinha are concerned with measuring a property of a fluid. The set up of Lichte, as seen in figure 1, has a tank (where the contents are to be measured utilizing a and ultrasonic transducer (110), control and processing circuitry (150), and a keyboard and display (155). With this in mind the device of Lichte could operate utilizing different circuitry to control the operation and behavior of the transducer, then the circuitry utilized in Lichte, utilizing the knowledge of one of ordinary skill in the art. In other words, the circuitry in Lichte could be replaced with the circuitry of Sinha (26 of Sinha's figure 1c), thus producing the circuit arrangement desired to generate at least two acoustic resonance responses, with the transducer in physical contact with the outside bottom wall of a container (from Lichte, see column 3 lines 40 through 56, where it states the transducer is affixed to the base of a container by means of an adapter). Lichte further discloses that the liquid does not fill the entire container volume of the container and a gas fills the remaining volume (from Lichte, see column 3 lines 40 through 56), so the substance of this rejection utilizes the transducer and tank arrangement of Lichte with the circuitry arrangement of Sinha to produce the system of claims 1, 6, 17, 18, and 19.

With regard to claims 2, 8, and 9, Sinha discloses in column 4 lines 15 through 30 the use of a swept sine wave generator.

With regard to claims 3, and 10, column 5 lines 10 through 30 disclose the use of the fast Fourier Transform for analyzing the resonance responses.

With regard to claims 4, and 11, the examiner acknowledges that the Sinha reference discloses that it is preferred that a frequency range between wall resonances are used (see column 6 lines 5 through 30), however, this same section discloses the fact that any frequency range could be used, thus a frequency range including at least one acoustic wall resonance would be disclosed by Sinha.

With regard to claim 7, figure 1c is disclosed to utilize a transducer as a transmitter and receiver.

With regard to claim 13, Sinha discloses a method for measuring liquid level in a container which comprises the steps of (a) generating at least two acoustic resonances in the liquid substantially perpendicular to the surface of the liquid, and (b) determining the frequency of at least two acoustic resonances. These limitations are shown in view of figure 1c and the disclosure in column 4 beginning at line 15 and ending in column 6 with line 17. However, as discussed above, Sinha fails to disclose a method for measuring the level of a liquid having a surface in contact with a gas. For these limitations, as discussed above, we rely on the teachings of Lichte, which discloses such an arrangement.

With regard to claim 14, the method for measuring liquid level in a container as described in claim 13, wherein the acoustic resonances are generated using a waveform comprising a sine wave is disclosed in column 4 lines 26 through 31 of Sinha.

With regard to claim 15, the method for measuring liquid level in a container as described in claim 14, wherein the sine wave is swept over frequencies comprising at least one acoustic wall resonance of a wall of the container perpendicular to the surface of the liquid is disclosed in column 6 lines 10 through 14 of Sinha.

With regard to claim 20, a method for measuring liquid level in a container which comprises the steps of (a) generating at least two acoustic resonances in the liquid substantially parallel to the surface of the liquid, and (b) detecting the presence of acoustic resonances from the liquid. These limitations are shown in view of figure 1c and the disclosure of Sinha in column 4 beginning at line 15 and ending in column 6 with line 17. As previously discussed in view of method claim 13, since Sinha fails to disclose a method for measuring the level of a liquid having a surface in contact with a gas, we rely on the teachings of Lichte, which discloses such an arrangement.

Allowable Subject Matter

5. Claims 5, 12, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney T. Frank whose telephone number is (571) 272-2193. The examiner can normally be reached on M-F 9-5:30 p.m. EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RTF

April 6, 2006


HEZRON WILLIAMS
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